

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw Desc	Image
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☐ 3. Document ID: US 6751635 B1

L1: Entry 3 of 3

File: USPT

Jun 15, 2004

US-PAT-NO: 6751635

DOCUMENT-IDENTIFIER: US 6751635 B1

TITLE: File deletion and truncation using a zombie file space

DATE-ISSUED: June 15, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Chen; Ray	Campbell	CA		
Edwards; John K.	Sunnyvale	CA		
Patel; Kayuri	Cupertino	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Network Appliance, Inc.	Sunnyvale	CA			02

APPL-NO: 09/642066 [PALM]

DATE FILED: August 18, 2000

INT-CL-ISSUED: [07] G06 F 17/30

US-CL-ISSUED: 707/200; 707/10, 707/202, 707/206

US-CL-CURRENT: 707/200; 707/10, 707/202, 707/206

FIELD-OF-CLASSIFICATION-SEARCH: 707/10, 707/201, 707/203, 707/206, 707/204, 707/205, 707/200, 707/202, 711/113, 711/114, 709/203, 709/219, 709/229

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4888681</u>	December 1989	Barnes et al.	707/101
<u>4937763</u>	June 1990	Mott	702/183
<u>5067099</u>	November 1991	McCown et al.	702/183
<u>5088031</u>	February 1992	Takasaki et al.	709/100
<u>5155835</u>	October 1992	Belsan	711/114
<u>5193184</u>	March 1993	Belsan et al.	711/4
<u>5317728</u>	May 1994	Tevis et al.	707/204
<u>5403639</u>	April 1995	Belsan et al.	707/204
<u>5535375</u>	July 1996	Eshel et al.	703/27

<u>5557747</u>	September 1996	Rogers et al.	709/223
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<u>5617568</u>	April 1997	Ault et al.	
<u>5832522</u>	November 1998	Blickenstaff et al.	707/204
<u>5946685</u>	August 1999	Cramer et al.	707/10
<u>5963962</u>	October 1999	Hitz et al.	707/202
<u>5991753</u>	November 1999	Wilde	707/2
<u>5996054</u>	November 1999	Ledain et al.	711/203
<u>6026402</u>	February 2000	Vossen et al.	
<u>6041334</u>	March 2000	Cannon	707/204
<u>6101508</u>	August 2000	Wolff	709/223
<u>6112211</u>	August 2000	Bradshaw et al.	707/205
<u>6173293</u>	January 2001	Thekkath et al.	707/201
<u>6247024</u>	June 2001	Kincaid	707/204
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<u>6289356</u>	September 2001	Hitz et al.	707/201
<u>6334114</u>	December 2001	Jacobs et al.	705/26
<u>6353878</u>	March 2002	Dunham	711/162
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<u>6529921</u>	March 2003	Berkowitz et al.	715/500.1
<u>2002/0083081</u>	June 2002	Chen et al.	
<u>2002/0089508</u>	July 2002	Sowizral et al.	345/522

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FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
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0 474 395	August 1991	EP	
0537098	April 1993	EP	
702 815	August 2000	EP	
WO 94/29807	December 1994	WO	
WO 00/11553	March 2000	WO	
WO 02/19110	August 2001	WO	

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Ott et al., SRED: Stabilized RED, undated, Bellcore and Bell Laboratory, pp. 1-10.*

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Dave Hitz, James Lau & Michael Malcolm, Network Appliance, Technical Report 3002, Rev. C 3/95, "File System Design for an NFS File Server Appliance", Usenix Winter 1994, San Francisco, CA, 1994 The Usenix Association, Jan., 1994.

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Mulqueen, John T., Product Analysis Review. Communications Week, vol. 452, p. 25, May 3, 1993.

John Ousterhout & Fred Douglass, "Beating the I/O Bottleneck: A Case for Log-Structured File Systems". Electrical Engineering and Computer Sciences, UC Berkeley, CA, Oct., 1988.

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David Simpson, "`Appliances` Take Over File Server Role", Digital News and Review, vol. 11, No. 6, pp. 1-2, Mar. 21, 1994.

TUX 2: Slashdot.com TUX 2 "The File System That Would Be King", Microsoft Internet Explorer, Oct. 20, 2000.

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ART-UNIT: 2177

PRIMARY-EXAMINER: Homere; Jean R.

ASSISTANT-EXAMINER: Wong; Leslie

ATTY-AGENT-FIRM: Swernofsky Law Group PC

ABSTRACT:

A method and system for reliably performing extra-long operations in a reliable state-full system (such as a file system). The file system includes a separate portion of the file system reserved for files having extra-long operations in progress, including file deletion and file truncation. This separate portion of the file system is called the zombie file space; it includes a separate name space from the regular ("live") file system that is accessible to users, and is maintained as part of the file system when recording a consistency point.

27 Claims, 4 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	WMC	Draw Desc	Image
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Clear	Generate Collection	Print	Fwd Refs	Bkwd Refs	Generate OACS
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Term	Documents
ZOMBIE	193
ZOMBIES	57
FILESPACE	37
FILESPPACES	4
(FILESPACE NEAR ZOMBIE) .PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	3
(ZOMBIE NEAR FILESPACE) .PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	3

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Search Results - Record(s) 1 through 3 of 3 returned.

☐ 1. Document ID: US 20050033775 A1

Using default format because multiple data bases are involved.

L1: Entry 1 of 3

File: PGPB

Feb 10, 2005

PGPUB-DOCUMENT-NUMBER: 20050033775

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20050033775 A1

TITLE: File deletion and truncation using a zombie file space

PUBLICATION-DATE: February 10, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Chen, Ray	Campbell	CA	US
Edwards, John K.	Sunnyvale	CA	US
Patel, Kayuri	Cupertino	CA	US

US-CL-CURRENT: 707/200

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	ISAC	Draw Desc	Image
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☐ 2. Document ID: US 20020083081 A1

L1: Entry 2 of 3

File: PGPB

Jun 27, 2002

PGPUB-DOCUMENT-NUMBER: 20020083081

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020083081 A1

TITLE: Manipulation of zombie files and evil-twin files

PUBLICATION-DATE: June 27, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Chen, Raymond C.	Campbell	CA	US
Edwards, John	Sunnyvale	CA	US
Patel, Kayuri	Cupertino	CA	US

US-CL-CURRENT: 707/200

[First Hit](#)[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

Generate Collection

Print

L6: Entry 5 of 16

File: PGPB

Sep 4, 2003

DOCUMENT-IDENTIFIER: US 20030167287 A1

TITLE: Information protection system

Detail Description Paragraph:

[0061] The file checking process may perform an additional check for unauthorized zombie files at the target location 110. If a file is found at the target location 110 that is not contained in archive 100, then the file is checked to determine if it is a zombie file. This zombie file check may include checking the file against a list of files and folders that are to be excluded for checking for added files. If the file is in the exclusion list, then the added file is ignored. If the file is not in the exclusion list, then the file at the target location 110 may be copied into quarantine area 120 and removed from the target location 110. The zombie file check process may be utilized to prevent hackers from placing files on a web site with the intent of using the web server as a Zombie server to host their files.

Detail Description Paragraph:

[0062] A file quarantine process in accordance with various aspects of the present invention, referring now to FIG. 9, suitably uses a quarantine area 120 to hold files that have been detected as altered files or as zombie files, so that the files may be later inspected. During a file checking session, a location within the quarantine area may be created (step 900) when the first file that needs to be quarantined is detected. The quarantine location may be identified (step 910) by use of a unique identifier such as using the date and time of the file checking processes, the name of the file collection 300 that is being checked, the name of the target location 110 that is holding the altered file, and/or the name of the altered file itself.

[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

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[First Hit](#) [Clear](#)[Generate Collection](#)[Print](#)[Fwd Refs](#)[Bkwd Refs](#)[Generate OACS](#)

Search Results - Record(s) 1 through 16 of 16 returned.

☐ 1. Document ID: US 20050033775 A1

Using default format because multiple data bases are involved.

L6: Entry 1 of 16

File: PGPB

Feb 10, 2005

PGPUB-DOCUMENT-NUMBER: 20050033775

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20050033775 A1

TITLE: File deletion and truncation using a zombie file space

PUBLICATION-DATE: February 10, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Chen, Ray	Campbell	CA	US
Edwards, John K.	Sunnyvale	CA	US
Patel, Kayuri	Cupertino	CA	US

US-CL-CURRENT: 707/200

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	IMMC	Draw Desc	Image
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☐ 2. Document ID: US 20040139273 A1

L6: Entry 2 of 16

File: PGPB

Jul 15, 2004

PGPUB-DOCUMENT-NUMBER: 20040139273

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040139273 A1

TITLE: Space allocation in a write anywhere file system

PUBLICATION-DATE: July 15, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Doucette, Douglas P.	Freeland	WA	US
Lewis, Blake	Palo Alto	CA	US
Edwards, John K.	Sunnyvale	CA	US

US-CL-CURRENT: 711/100

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RWMC	Draw Desc	Image
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☐ 3. Document ID: US 20040059866 A1

L6: Entry 3 of 16

File: PGPB

Mar 25, 2004

PGPUB-DOCUMENT-NUMBER: 20040059866
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040059866 A1

TITLE: System and method for representing named data streams within an on-disk structure of a file system

PUBLICATION-DATE: March 25, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Patel, Kayuri	Cupertino	CA	US
Muhlestein, Mark	Tuscon	AZ	US

US-CL-CURRENT: 711/100

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RWMC	Draw Desc	Image
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☐ 4. Document ID: US 20030182253 A1

L6: Entry 4 of 16

File: PGPB

Sep 25, 2003

PGPUB-DOCUMENT-NUMBER: 20030182253
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030182253 A1

TITLE: System and method for restoring a single file from a snapshot

PUBLICATION-DATE: September 25, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Chen, Raymond C.	Campbell	CA	US
Patel, Kayuri	Cupertino	CA	US
Kahn, Andy C.	San Francisco	CA	US
Edwards, John K.	Sunnyvale	CA	US

US-CL-CURRENT: 707/1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RWMC	Draw Desc	Image
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☐ 5. Document ID: US 20030167287 A1

L6: Entry 5 of 16

File: PGPB

Sep 4, 2003

PGPUB-DOCUMENT-NUMBER: 20030167287
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030167287 A1

TITLE: Information protection system

PUBLICATION-DATE: September 4, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Forster, Karl	Paradise Valley	AZ	US

US-CL-CURRENT: 707/203

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Image
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☐ 6. Document ID: US 20020083081 A1

L6: Entry 6 of 16

File: PGPB

Jun 27, 2002

PGPUB-DOCUMENT-NUMBER: 20020083081
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020083081 A1

TITLE: Manipulation of zombie files and evil-twin files

PUBLICATION-DATE: June 27, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Chen, Raymond C.	Campbell	CA	US
Edwards, John	Sunnyvale	CA	US
Patel, Kayuri	Cupertino	CA	US

US-CL-CURRENT: 707/200

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Image
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☐ 7. Document ID: US 20020083037 A1

L6: Entry 7 of 16

File: PGPB

Jun 27, 2002

PGPUB-DOCUMENT-NUMBER: 20020083037
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020083037 A1

TITLE: Instant snapshot

PUBLICATION-DATE: June 27, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Lewis, Blake	Palo Alto	CA	US
Edwards, John	Sunnyvale	CA	US
Viswanathan, Srinivasan	Fremont	CA	US

US-CL-CURRENT: 707/1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	WWW	Draw Desc	Image
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☐ 8. Document ID: US 6952797 B1

L6: Entry 8 of 16

File: USPT

Oct 4, 2005

US-PAT-NO: 6952797

DOCUMENT-IDENTIFIER: US 6952797 B1

TITLE: Block-appended checksums

DATE-ISSUED: October 4, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kahn; Andy	Santa Clara	CA	95050	
Sundaram; Rajesh	Mountain View	CA	94040	
Viswanathan; Srinivasan	Fremont	CA	94536	
Kleiman; Steven R.	Los Altos	CA	94022	

APPL-NO: 09/696666 [PALM]

DATE FILED: October 25, 2000

INT-CL-ISSUED: [07] G11 C 29/00, H03 M 13/00

US-CL-ISSUED: 714/770; 714/758

US-CL-CURRENT: 714/770; 714/758

FIELD-OF-CLASSIFICATION-SEARCH: 714/770, 714/758

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
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<u>5088081</u>	February 1992	Farr	
<u>5195100</u>	March 1993	Katz et al.	
<u>5208813</u>	May 1993	Stallmo	

<u>5235601</u>	August 1993	Stallmo et al.	
<u>5239640</u>	August 1993	Froemke et al.	
<u>5278838</u>	January 1994	Ng et al.	
<u>5283791</u>	February 1994	Halford	714/766
<u>5313626</u>	May 1994	Jones et al.	
<u>5341381</u>	August 1994	Fuller	
<u>5386425</u>	January 1995	Kim	714/755
<u>5392290</u>	February 1995	Brown et al.	714/6
<u>5517484</u>	May 1996	Takagi et al.	
<u>5537567</u>	July 1996	Galbraith et al.	
<u>5666511</u>	September 1997	Suganuma et al.	711/114
<u>5675726</u>	October 1997	Hohenstein et al.	
<u>5696775</u>	December 1997	Nemazie et al.	
<u>5758057</u>	May 1998	Baba et al.	714/7
<u>5765183</u>	June 1998	Kojima et al.	
<u>5864440</u>	January 1999	Hashimoto et al.	360/53
<u>5864655</u>	January 1999	Dewey et al.	714/7
<u>5903532</u>	May 1999	Ikeda	
<u>5948110</u>	September 1999	Hitz et al.	
<u>5963962</u>	October 1999	Hitz et al.	
<u>6006308</u>	December 1999	Matsunami et al.	711/114
<u>6317844</u>	November 2001	Kleiman	
<u>6637007</u>	October 2003	Bots	

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
694 25 658	April 2001	DE	
0 462 917	December 1991	EP	
0 462 917	December 1991	EP	
0 462 917	December 1991	EP	
0 466 296	January 1992	EP	
0 492 808	July 1992	EP	
0 492 808	July 1992	EP	
0 559 488	September 1993	EP	
0 997 900	May 2000	EP	
0 702 815	August 2000	EP	
0 927 395	May 2003	EP	
07-261947	July 1996	JP	
WO 94/29807	December 1994	WO	
WO 03/009286	January 2003	WO	

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IBM Technical Disclosure Bulletin, vol. 36 No. 03, Mar. 1993, "Parity Preservation for Redundant Array of Independent Direct Access Storage Device Data Loss Minimization and Repair". XP000354845.

Steven R. Kleiman et al., "Using NUMA Interconnects for Highly Available Filers", Jan.-Feb.

1999. IEEE.

Jai Menon et al., "The Architecture of a Fault-Tolerant Cached RAID Controller", IEEE Computer Society Press, Los Alamitos, California, May 16-19, 1993. XP000398988.

Slashdot. Tux2: "The Filesystem That Would Be King", Oct. 17, 2000.

IBM. "Automated Problem Reporting." IBM Technical Disclosure Bulletin, Nov. 1989, pp. 466-468, vol. 32, no. 6A.

Kegel. "Apache Problem Report Database." <http://bugs.apache.org/>, May 24, 1999.

ART-UNIT: 2133

PRIMARY-EXAMINER: Torres; Joseph D.

ATTY-AGENT-FIRM: Swernofsky Law Group PC

ABSTRACT:

A method and apparatus for a reliable data storage system using block level checksums appended to data blocks. Files are stored on hard disks in storage blocks, including data blocks and block-appended checksums. The block-appended checksum includes a checksum of the data block, a VBN, a DBN, and an embedded checksum for checking the integrity of the block-appended checksum itself. A file system includes file blocks with associated block-appended checksum to the data blocks. The file blocks with block-appended checksums are written to storage blocks. In a preferred embodiment a collection of disk drives are formatted with 520 bytes of data per sector. For each 4,096-byte file block, a corresponding 64-byte block-appended checksum is appended to the file block with the first 7 sectors including most of the file block data while the 8.sup.th sector includes the remaining file block data and the 64-byte block-appended checksum.

18 Claims, 3 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMIC	Draw Desc	Image
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☐ 9. Document ID: US 6910154 B1

L6: Entry 9 of 16

File: USPT

Jun 21, 2005

US-PAT-NO: 6910154

DOCUMENT-IDENTIFIER: US 6910154 B1

TITLE: Persistent and reliable delivery of event messages

DATE-ISSUED: June 21, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Schoenthal; Scott	San Ramon	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Network Appliance, Inc.	Sunnyvale	CA			02

APPL-NO: 09/642064 [PALM]

DATE FILED: August 18, 2000

INT-CL-ISSUED: [07] G06 F 11/00

US-CL-ISSUED: 714/18; 714/17

US-CL-CURRENT: 714/18; 714/17

FIELD-OF-CLASSIFICATION-SEARCH: 714/18, 714/17, 714/16, 714/15, 714/4, 714/12, 714/48
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4937763</u>	June 1990	Mott	364/550
<u>5067099</u>	November 1991	McCown et al.	364/550
<u>5224095</u>	June 1993	Woest et al.	370/401
<u>5265229</u>	November 1993	Sareen	710/100
<u>5423068</u>	June 1995	Hecker	455/438
<u>6119244</u>	September 2000	Schoenthal et al.	714/4
<u>6477564</u>	November 2002	Freyssinet et al.	709/202
<u>6519712</u>	February 2003	Kim et al.	714/15
<u>6545981</u>	April 2003	Garcia et al.	370/242

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
0537098	April 1993	EP	

OTHER PUBLICATIONS

Lowell, David E. and Chen, Peter M.; "Persistent Messages in Local Transactions", Jun. 1998; 17.sup.th ACM Symposium on Principles of Distributed Computing; Jun. 1998.
Borg, Anita et al.; "Fault Tolerance Under UNIX"; Feb. 1989; ACM Transactions on Computer Systems, vol 7, No. 1, Feb. 1989, pp. 1-247.

ART-UNIT: 2114

PRIMARY-EXAMINER: Baderman; Scott

ASSISTANT-EXAMINER: Lohn; Joshua

ATTY-AGENT-FIRM: Swernofsky Law Group PC

ABSTRACT:

The invention provides a method and system for persistent and reliable delivery of event messages. Those parts of the system responsible for delivering event messages are able to persistently maintain those event messages until the intended recipient of the event message confirms delivery of those event messages. Those parts of the system responsible for recovering

from system crashes and other system errors are able to persistently maintain those event messages until delivery, even after recovery from system crashes or other system errors. The system includes a set of event message producers, and maintains an event-indication queue of those event messages provided by the event producers using a set of pre-allocated resources. An event-distribution engine distributes event messages to intended recipients and, after having received confirmation that the event messages were received, removes them from the event-indication queue. Recipients of event messages receive the event messages, acknowledge their receipt thereof, and might take action in response to the event message. The system includes persistent memory, initialization memory, and recipient persistent memories, and provides upon recovery from system crashes or other system error, an ability to replay event messages recorded in those memories, to re-present them as event messages. A cluster of file servers collectively forming a highly-available system shares persistent memories, so that upon a system crash or other system error, at least one other file server has a record of those event messages.

27 Claims, 4 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	RMC	Draw Desc	Image
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☐ 10. Document ID: US 6757695 B1

L6: Entry 10 of 16

File: USPT

Jun 29, 2004

US-PAT-NO: 6757695

DOCUMENT-IDENTIFIER: US 6757695 B1

TITLE: System and method for mounting and unmounting storage volumes in a network storage environment

DATE-ISSUED: June 29, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Noveck; David B.	Lexington	MA		
Chen; Raymond C.	Campbell	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Network Appliance, Inc.	Sunnyvale	CA			02

APPL-NO: 09/925919 [PALM]

DATE FILED: August 9, 2001

INT-CL-ISSUED: [07] H06 F 17/30

US-CL-ISSUED: 707/200; 707/101

US-CL-CURRENT: 707/200; 707/101

FIELD-OF-CLASSIFICATION-SEARCH: 707/8, 707/102, 707/205, 710/8, 710/19, 710/302, 711/114, 711/118, 711/156, 714/4, 714/6

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>5163131</u>	November 1992	Row et al.	
<u>5355453</u>	October 1994	Row et al.	
<u>5363487</u>	November 1994	Willman et al.	710/8
<u>5485579</u>	January 1996	Hitz et al.	
<u>5497457</u>	March 1996	Ford	714/6
<u>5802366</u>	September 1998	Row et al.	
<u>5819292</u>	October 1998	Hitz et al.	
<u>5931918</u>	August 1999	Row et al.	
<u>5941972</u>	August 1999	Hoese et al.	
<u>5948110</u>	September 1999	Hitz et al.	714/6
<u>5950225</u>	September 1999	Kleiman	
<u>5963962</u>	October 1999	Hitz et al.	
<u>5999930</u>	December 1999	Wolff	707/8
<u>6038570</u>	March 2000	Hitz et al.	
<u>6052692</u>	April 2000	Anderson et al.	707/102
<u>6065037</u>	May 2000	Hitz et al.	
<u>6119244</u>	September 2000	Schoenthal et al.	714/4
<u>6138126</u>	October 2000	Hitz et al.	
<u>6425035</u>	July 2002	Hoese et al.	

OTHER PUBLICATIONS

U.S. Pending patent application entitled, Manipulation of Zombie Files and Evil-Twin Files, Ray Chen et al., Ser. No. 09/642,066, Filed: Aug. 18, 2000, all pages.

U.S. Pending patent application entitled, Operator Initiated Graceful Takeover in a Node Cluster, Cramer et al., Ser. No. 09/933,866, Filed: Aug. 20, 2001, all pages.

ART-UNIT: 2175

PRIMARY-EXAMINER: Mizrahi; Diane D.

ASSISTANT-EXAMINER: Mofiz; Apu

ATTY-AGENT-FIRM: Cesari and McKenna, LLP

ABSTRACT:

A system and method for mounting and unmounting volumes attached to a data storage system, such as a file server, tracks specific sub-states within each of the overall mounting and unmounting procedure states, in which specific file system requests are and are not allowed (as appropriate) with respect to the mounting/unmounting volume based upon the sub-state. More specifically, for mounting or unmounting, a storage operating system in the file server transitions a volume through a series of sub-states, as tracked in appropriate control structures. Each sub-state is characterized by a set of permitted operations that may be performed while the volume is in that sub-state, entrance and exit criteria for that sub-state, and restricted operations that may not be performed while the volume is that sub-state. During transaction request handling, the storage operating system validates each request against the sub-state to determine the disposition of the request. Then, depending on the request and the

sub-state, the storage operating system will execute the request, ignore the request, hold the request for later execution, or return an error message to the client originating the request.

24 Claims, 9 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	DOC	Draw Desc	Image
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☐ 11. Document ID: US 6751635 B1

L6: Entry 11 of 16

File: USPT

Jun 15, 2004

US-PAT-NO: 6751635

DOCUMENT-IDENTIFIER: US 6751635 B1

TITLE: File deletion and truncation using a zombie file space

DATE-ISSUED: June 15, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Chen; Ray	Campbell	CA		
Edwards; John K.	Sunnyvale	CA		
Patel; Kayuri	Cupertino	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Network Appliance, Inc.	Sunnyvale	CA			02

APPL-NO: 09/642066 [PALM]

DATE FILED: August 18, 2000

INT-CL-ISSUED: [07] G06 F 17/30

US-CL-ISSUED: 707/200; 707/10, 707/202, 707/206

US-CL-CURRENT: 707/200; 707/10, 707/202, 707/206

FIELD-OF-CLASSIFICATION-SEARCH: 707/10, 707/201, 707/203, 707/206, 707/204, 707/205, 707/200, 707/202, 711/113, 711/114, 709/203, 709/219, 709/229

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4888681</u>	December 1989	Barnes et al.	707/101
<u>4937763</u>	June 1990	Mott	702/183
<u>5067099</u>	November 1991	McCown et al.	702/183
<u>5088031</u>	February 1992	Takasaki et al.	709/100
<u>5155835</u>	October 1992	Belsan	711/114

<u>5193184</u>	March 1993	Belsan et al.	711/4
<u>5317728</u>	May 1994	Tevis et al.	707/204
<u>5403639</u>	April 1995	Belsan et al.	707/204
<u>5535375</u>	July 1996	Eshel et al.	703/27
<u>5557747</u>	September 1996	Rogers et al.	709/223
<u>5564037</u>	October 1996	Lam	711/161
<u>5617568</u>	April 1997	Ault et al.	
<u>5832522</u>	November 1998	Blickenstaff et al.	707/204
<u>5946685</u>	August 1999	Cramer et al.	707/10
<u>5963962</u>	October 1999	Hitz et al.	707/202
<u>5991753</u>	November 1999	Wilde	707/2
<u>5996054</u>	November 1999	Ledain et al.	711/203
<u>6026402</u>	February 2000	Vossen et al.	
<u>6041334</u>	March 2000	Cannon	707/204
<u>6101508</u>	August 2000	Wolff	709/223
<u>6112211</u>	August 2000	Bradshaw et al.	707/205
<u>6173293</u>	January 2001	Thekkath et al.	707/201
<u>6247024</u>	June 2001	Kincaid	707/204
<u>6249792</u>	June 2001	Zwilling et al.	707/205
<u>6289356</u>	September 2001	Hitz et al.	707/201
<u>6334114</u>	December 2001	Jacobs et al.	705/26
<u>6353878</u>	March 2002	Dunham	711/162
<u>6366988</u>	April 2002	Skiba et al.	711/165
<u>6529921</u>	March 2003	Berkowitz et al.	715/500.1
<u>2002/0083081</u>	June 2002	Chen et al.	
<u>2002/0089508</u>	July 2002	Sowizral et al.	345/522

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FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
694 25 658	August 2000	DE	400/332.4
0 474 395	August 1991	EP	
0537098	April 1993	EP	
702 815	August 2000	EP	
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Elnozahy et al., A Survey of Rollback-Recovery Protocols in Message-Passing Systems, ACM Computing surveys, vol. 34, No. 3, Sep. 2002, pp. 375-408.*

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David Hitz, "Technical Report TRO1: An NFS File Server Appliance", Rev. A 8/93, Network Appliance Corporation, Santa Clara, CA.

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ART-UNIT: 2177

PRIMARY-EXAMINER: Homere; Jean R.

ASSISTANT-EXAMINER: Wong; Leslie

ATTY-AGENT-FIRM: Swernofsky Law Group PC

ABSTRACT:

A method and system for reliably performing extra-long operations in a reliable state-full system (such as a file system). The file system includes a separate portion of the file system reserved for files having extra-long operations in progress, including file deletion and file truncation. This separate portion of the file system is called the zombie file space; it includes a separate name space from the regular ("live") file system that is accessible to users, and is maintained as part of the file system when recording a consistency point.

27 Claims, 4 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw Desc	Image
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☐ 12. Document ID: US 6728922 B1

L6: Entry 12 of 16

File: USPT

Apr 27, 2004

US-PAT-NO: 6728922

DOCUMENT-IDENTIFIER: US 6728922 B1

TITLE: Dynamic data space

DATE-ISSUED: April 27, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
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Sundaram; Rajesh	Mountain View	CA
Viswanathan; Srinivasan	Fremont	CA
Rowe; Alan	San Jose	CA
Kleiman; Steven R.	Los Altos	CA
Edwards; John K.	Sunnyvale	CA

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Network Appliance, Inc.	Sunnyvale	CA			02

APPL-NO: 09/642062 [PALM]

DATE FILED: August 18, 2000

INT-CL-ISSUED: [07] G11 C 29/00

US-CL-ISSUED: 714/769; 714/763, 714/770

US-CL-CURRENT: 714/769; 714/763, 714/770

FIELD-OF-CLASSIFICATION-SEARCH: 711/162, 707/204, 707/102, 714/763, 714/764, 714/769, 714/770
See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4527232</u>	July 1985	Bechtolsheim	
<u>4742447</u>	May 1988	Duvall et al.	
<u>4742450</u>	May 1988	Duvall et al.	
<u>4761785</u>	August 1988	Clark et al.	
<u>4875159</u>	October 1989	Cary et al.	
<u>4937763</u>	June 1990	Mott	364/550
<u>5008786</u>	April 1991	Thatte	
<u>5043876</u>	August 1991	Terry	
<u>5067099</u>	November 1991	McCown et al.	364/550
<u>5088081</u>	February 1992	Farr	
<u>5144659</u>	September 1992	Jones	
<u>5146588</u>	September 1992	Crater et al.	
<u>5155835</u>	October 1992	Belsan	
<u>5163131</u>	November 1992	Row et al.	
<u>5163148</u>	November 1992	Walls	
<u>5195100</u>	March 1993	Katz et al.	
<u>5218695</u>	June 1993	Noveck et al.	
<u>5218696</u>	June 1993	Baird et al.	
<u>5222217</u>	June 1993	Blount et al.	
<u>5235601</u>	August 1993	Stallmo et al.	
<u>5274799</u>	December 1993	Brant et al.	
<u>5274807</u>	December 1993	Hoshen et al.	
<u>5297265</u>	March 1994	Frank et al.	

<u>5305326</u>	April 1994	Solomon et al.	
<u>5315602</u>	May 1994	Noya et al.	
<u>5333305</u>	July 1994	Neufeld	
<u>5335235</u>	August 1994	Arnott	
<u>5357509</u>	October 1994	Ohizumi	
<u>5379417</u>	January 1995	Lui et al.	
<u>5490248</u>	February 1996	Dan et al.	
<u>5502836</u>	March 1996	Hale et al.	
<u>5649152</u>	July 1997	Ohran et al.	
<u>5668943</u>	September 1997	Attanasio et al.	
<u>5668958</u>	September 1997	Bendert et al.	
<u>5675726</u>	October 1997	Hohenstein et al.	
<u>5678006</u>	October 1997	Valizadeh et al.	
<u>5737744</u>	April 1998	Callison et al.	
<u>5742752</u>	April 1998	DeKoning	
<u>5819292</u>	October 1998	Hitz et al.	
<u>5819310</u>	October 1998	Vishlitzky et al.	
<u>5828876</u>	October 1998	Fish et al.	
<u>5829046</u>	October 1998	Tzelnic et al.	711/162
<u>5835953</u>	November 1998	Ohran	
<u>5907672</u>	May 1999	Matze et al.	
<u>5948110</u>	September 1999	Hitz et al.	
<u>5950225</u>	September 1999	Kleiman	
<u>5963962</u>	October 1999	Hitz et al.	
<u>6000039</u>	December 1999	Tanaka et al.	
<u>6061770</u>	May 2000	Franklin	711/162
<u>6076148</u>	June 2000	Kedem	
<u>6101585</u>	August 2000	Brown et al.	
<u>6119244</u>	September 2000	Schoenthal et al.	
<u>6138126</u>	October 2000	Hitz et al.	
<u>6397229</u>	May 2002	Menon et al.	707/204
<u>6578041</u>	June 2003	Lomet	707/102

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FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
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0 492 808	July 1992	EP	
0 497 067	August 1992	EP	
0537098	April 1993	EP	
0 552 580	July 1993	EP	
0 569 313	November 1993	EP	
WO 91/13404	September 1991	WO	
WO 93/13475	July 1993	WO	
WO 94/29796	December 1994	WO	
WO 98/21656	May 1998	WO	

WO 98/38576	September 1998	WO
WO 00/07104	February 2000	WO
WO 01/31446	May 2001	WO

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Jim Gray et al., "Parity Striping of Disc Arrays: Low-Cost Reliable Storage with Acceptable Throughput", Proceedings of the 16.sup.th VLDB Conference, Brisbane, Australia 1990. Tandem Computers Inc., 19333 Vallco Parkway, Cupertino, California. XP000522459.

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Steven R. Kleiman et al., "Using NUMA Interconnects for Highly Available Filers", 1999 IEEE.

Jai Menon et al., "The Architecture of a Fault-Tolerant Cached RAID Controller", IEEE Computer Society, Los Alamitos, California, May 16-19, 1993. XP000398988.

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Slashdot, TUX 2: "The File System that Would Be King".

David Tweeten, "Hiding Mass Storage Under UNIX: Nasa's MSS-II Architecture", NAS Systems Division, NASA Ames Research Center, Moffett Field, California, 1990 IEEE.

ART-UNIT: 2133

PRIMARY-EXAMINER: Ton; David

ATTY-AGENT-FIRM: Swernofsky Law Group PC

ABSTRACT:

A data storage system, such as RAID, upgraded dynamically including multiple stages, providing error checking data without taking the system off-line. Checksums are computed from the data and placed in block 63 of the same disk. The combination of parity bits across the parity disk, the remaining uncorrupted data in the data disks, and checksums within each disk includes sufficient information to enable restoration of corrupt data. The system is upgraded by reserving permanent checksum blocks, writing the checksums to a volume block number, and placing the checksums in permanently reserved checksum block locations after first moving data already there to unreserved blocks.

42 Claims, 3 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	NOTE	Draw Desc	Image
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☐ 13. Document ID: US 6643654 B1

L6: Entry 13 of 16

File: USPT

Nov 4, 2003

US-PAT-NO: 6643654

DOCUMENT-IDENTIFIER: US 6643654 B1

**** See image for Certificate of Correction ****

TITLE: System and method for representing named data streams within an on-disk structure of a file system

DATE-ISSUED: November 4, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Patel; Kayuri	Cupertino	CA		
Muhlestein; Mark	Tuscon	AZ		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Network Appliance, Inc.	Sunnyvale	CA			02

APPL-NO: 09/891159 [PALM]

DATE FILED: June 25, 2001

INT-CL-ISSUED: [07] G06 F 17/00

US-CL-ISSUED: 707/10; 709/217, 711/100

US-CL-CURRENT: 707/10; 709/217, 711/100

FIELD-OF-CLASSIFICATION-SEARCH: 707/1-10, 707/100-104, 707/200-206, 711/100-116, 711/117-146, 709/212-237

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>5819292</u>	October 1998	Hitz et al.	
<u>5948110</u>	September 1999	Hitz et al.	
<u>6038570</u>	March 2000	Hitz et al.	
<u>6178483</u>	January 2001	Runaldue et al.	711/137
<u>6230200</u>	May 2001	Forecast et al.	709/219
<u>6496899</u>	December 2002	DeMoney	711/112

OTHER PUBLICATIONS

Sheth et al., Data structure distribution and multi-threading of Linux file system for multiprocessors, High Performance Computing, 1998, HIPC '98 5th International Conference On, Dec. 17-20, 1998, pp. 97-104.*

Hsiao et al., Performance evaluation of cache depot on CC-NUMA multiprocessors, Parallel and Distributed Systems, 1998, Proceedings, 1998, International Conference on, Dec. 14-16, 1998, pp. 519-526.*

Brewer et al., The evolution of the HP/Convex Exemplar, Compcon '97, Proceedings, IEEE, Feb. 23-26, 1997, pp. 81-86.*

U.S. patent application Ser. No. 09/642,066, Ray Chen et al., filed Aug. 18, 2000.
SNIA Storage Networking Industry Association; Common Internet File System (CIFS), Version:
CIFS-Spec 0.9. Draft SNIA CIFS Work Group Work-in-Progress.

ART-UNIT: 2175

PRIMARY-EXAMINER: Jung; David

ATTY-AGENT-FIRM: Cesari and McKenna, LLP

ABSTRACT:

A technique provides on-disk representations of multiple named data streams for a file system of a network storage appliance. The network storage appliance or filer includes a file system that implements a Write Anywhere File Layout (WAFL) disk format, wherein files are described by inodes of which there may be various types, including directory and regular inodes. A named stream inode type is defined that represents named data streams in the WAFL file system. Multiple data streams may be stored on disk(s) of the filer as representations embodying the named stream inode type associated with a file. The names and file handles of the data streams are stored in a "hidden" directory within the file system that is referenced by the base mode. The hidden directory is represented as a stream_dir inode type.

29 Claims, 8 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	NAME	Draw Desc	Image
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☐ 14. Document ID: US 6636879 B1

L6: Entry 14 of 16

File: USPT

Oct 21, 2003

US-PAT-NO: 6636879

DOCUMENT-IDENTIFIER: US 6636879 B1

TITLE: Space allocation in a write anywhere file system

DATE-ISSUED: October 21, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Doucette; Douglas P.	Freeland	WA		
Lewis; Blake	Palo Alto	CA		
Edwards; John K.	Sunnyvale	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Network Appliance, Inc.	Sunnyvale	CA			02

APPL-NO: 09/642065 [PALM]

DATE FILED: August 18, 2000

INT-CL-ISSUED: [07] G06 F 17/30

US-CL-ISSUED: 707/205

US-CL-CURRENT: 707/205

FIELD-OF-CLASSIFICATION-SEARCH: 707/201, 707/202, 707/203, 707/204, 707/205, 360/48, 369/30.09, 711/165, 711/173, 714/4, 714/6

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4527232</u>	July 1985	Bechtolsheim	
<u>4742447</u>	May 1988	Duvall et al.	
<u>4742450</u>	May 1988	Duvall et al.	
<u>4761785</u>	August 1988	Clark et al.	
<u>4875159</u>	October 1989	Cary et al.	
<u>4937763</u>	June 1990	Mott	702/183
<u>5008786</u>	April 1991	Thatte	
<u>5043876</u>	August 1991	Terry	
<u>5067099</u>	November 1991	McCown et al.	702/183
<u>5088081</u>	February 1992	Farr	
<u>5144659</u>	September 1992	Jones	
<u>5146588</u>	September 1992	Crater et al.	
<u>5155835</u>	October 1992	Belsan	
<u>5163131</u>	November 1992	Row et al.	
<u>5163148</u>	November 1992	Walls	
<u>5195100</u>	March 1993	Katz et al.	
<u>5218695</u>	June 1993	Noveck et al.	
<u>5218696</u>	June 1993	Baird et al.	
<u>5222217</u>	June 1993	Blount et al.	
<u>5235601</u>	August 1993	Stallmo et al.	
<u>5274799</u>	December 1993	Brant et al.	
<u>5274807</u>	December 1993	Hoshen et al.	
<u>5297265</u>	March 1994	Frank et al.	
<u>5305326</u>	April 1994	Solomon et al.	
<u>5315602</u>	May 1994	Noya et al.	
<u>5333305</u>	July 1994	Neufeld	
<u>5335235</u>	August 1994	Arnott	
<u>5357509</u>	October 1994	Ohizumi	
<u>5379417</u>	January 1995	Lui et al.	
<u>5490248</u>	February 1996	Dan et al.	
<u>5502836</u>	March 1996	Hale et al.	
<u>5649152</u>	July 1997	Ohran et al.	
<u>5668943</u>	September 1997	Attanasio et al.	
<u>5668958</u>	September 1997	Bendert et al.	
<u>5675726</u>	October 1997	Hohenstein et al.	

<u>5678006</u>	October 1997	Valizadeh et al.	
<u>5737744</u>	April 1998	Callison et al.	
<u>5742752</u>	April 1998	DeKoning	
<u>5819292</u>	October 1998	Hitz et al.	707/203
<u>5819310</u>	October 1998	Vishlitzky et al.	
<u>5828876</u>	October 1998	Fish et al.	
<u>5835953</u>	November 1998	Ohran	
<u>5907672</u>	May 1999	Matze et al.	
<u>5948110</u>	September 1999	Hitz et al.	
<u>5950225</u>	September 1999	Kleiman	
<u>5963962</u>	October 1999	Hitz et al.	707/201
<u>6000039</u>	December 1999	Tanaka et al.	
<u>6038570</u>	March 2000	Hitz et al.	707/204
<u>6076148</u>	June 2000	Kedem	
<u>6101585</u>	August 2000	Brown et al.	
<u>6119244</u>	September 2000	Schoenthal et al.	
<u>6138126</u>	October 2000	Hitz et al.	707/202
<u>6289356</u>	September 2001	Hitz et al.	707/201

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
0 462 917	December 1991	EP	400/332.5
0 492 808	July 1992	EP	
0 497 067	August 1992	EP	
0537098	April 1993	EP	
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ART-UNIT: 2175

PRIMARY-EXAMINER: Mizrahi; Diane D.

ASSISTANT-EXAMINER: Mofiz; Apu M

ATTY-AGENT-FIRM: Swernofsky Law Group PC

ABSTRACT:

A method and system for improving data access of a reliable file system is provided. In a first aspect of the invention, the file system determines the relative vacancy of a collection of storage blocks, herein called an "allocation area". This is accomplished by recording an array of binary numbers. Each binary number in the array describes the vacancy of a collection of storage blocks. The file system examines these binary numbers when attempting to record file blocks in relatively contiguous areas on a storage medium, such as a hard disk. When a request to write to disk occurs, the system determines the average vacancy of all the allocation areas and queries the allocation areas for individual vacancy rates such as sequentially. The system preferably writes file blocks to the allocation areas that are above a threshold related to the average storage block vacancy of the file system. If the file in the request to write is larger than the selected allocation area, the next allocation area above the threshold is preferably used to write the remaining blocks of the file.

39 Claims, 3 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw Desc	Image
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☐ 15. Document ID: US 20020083081 A1

L6: Entry 15 of 16

File: DWPI

Jun 27, 2002

DERWENT-ACC-NO: 2002-583165

DERWENT-WEEK: 200262

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TITLE: File system operating method for file server system, involves recording changes to the zombie file space of a file system in a persistent memory

INVENTOR: CHEN, R C; EDWARDS, J ; PATEL, K

PRIORITY-DATA: 2001US-0932579 (August 17, 2001), 2000US-0642066 (August 18, 2000)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<u>US 20020083081 A1</u>	June 27, 2002		014	G06F012/00

INT-CL (IPC): G06 F 12/00

ABSTRACTED-PUB-NO: US20020083081A

BASIC-ABSTRACT:

NOVELTY - The method involves recording changes to the zombie file space of a file system in a persistent memory.

USE - For file server system.

ADVANTAGE - Enables reliable execution of extra-long operations in a file system.

DESCRIPTION OF DRAWING(S) - The figure shows the block diagram of a portion of a file system.

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Clip Img	Ima
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☐ 16. Document ID: US 20050033775 A1, WO 200219110 A2, EP 1311948 A2, US 6751635 B1

L6: Entry 16 of 16

File: DWPI

Feb 10, 2005

DERWENT-ACC-NO: 2002-339696

DERWENT-WEEK: 200512

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TITLE: File system operating method where file system includes live file space accessible to users and zombie file space not accessible to users recording changes to zombie file space in persistent memory

INVENTOR: CHEN, R; EDWARDS, J K ; PATEL, K

PRIORITY-DATA: 2000US-0642066 (August 18, 2000), 2004US-0868189 (June 15, 2004)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<u>US 20050033775 A1</u>	February 10, 2005		000	G06F007/00
<u>WO 200219110 A2</u>	March 7, 2002	E	027	G06F011/00
<u>EP 1311948 A2</u>	May 21, 2003	E	000	G06F011/14
<u>US 6751635 B1</u>	June 15, 2004		000	G06F017/30

INT-CL (IPC): G06 F 7/00; G06 F 11/00; G06 F 11/14; G06 F 17/30

ABSTRACTED-PUB-NO: WO 200219110A

BASIC-ABSTRACT:

NOVELTY - The method involves recording changes to a zombie file space in a persistent memory. The method further involves transferring a file from live file space to the zombie file space. Links associating disk blocks with the file are broken in several steps while the file is associated with the zombie file space. The recording of changes includes recording the breaking of links in several steps. The live file space is altered to reflect the deletion operation.

USE - For file server systems in which it is desired to maintain file system consistency.

ADVANTAGE - Provides technique for extra-long operations in a reliable state-full system (such as a file system) that is not subject to known drawbacks.

DESCRIPTION OF DRAWING(S) - The figure shows a file structure in a system using a zombie file space.

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw Desc	Clip Img	Ima
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Clear	Generate Collection	Print	Fwd Refs	Bkwd Refs	Generate OACS
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Term	Documents
ZOMBIE	193
ZOMBIES	57
FILE	1069695
FILES	176001
(ZOMBIE NEAR FILE) .PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	16
((ZOMBIE NEAR FILE)) .PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	16

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Term:

(zombie near file)

Display:

100

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<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR</i>			
<u>L7</u>	L6 and filespace	3	<u>L7</u>
<u>L6</u>	(zombie near file)	16	<u>L6</u>
<u>L5</u>	L4 and (zombie near file)	0	<u>L5</u>
<u>L4</u>	L3 and (deletion near file)	7	<u>L4</u>
<u>L3</u>	inaccessible near file	158	<u>L3</u>
<u>L2</u>	virtual near filespace	2	<u>L2</u>
<u>L1</u>	zombie near filespace	3	<u>L1</u>

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IBM Technical Disclosure Bulletins

Term:

L8 and filespace

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<u>L9</u>	L8 and filespace	3	<u>L9</u>
<u>L8</u>	(deletion near file)	1483	<u>L8</u>
<u>L7</u>	L6 and filespace	3	<u>L7</u>
<u>L6</u>	(zombie near file)	16	<u>L6</u>
<u>L5</u>	L4 and (zombie near file)	0	<u>L5</u>
<u>L4</u>	L3 and (deletion near file)	7	<u>L4</u>
<u>L3</u>	inaccessible near file	158	<u>L3</u>
<u>L2</u>	virtual near filespace	2	<u>L2</u>
<u>L1</u>	zombie near filespace	3	<u>L1</u>

END OF SEARCH HISTORY